

**CLAIMS**

What is claimed is:

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1. A method for establishing a path identifier for a communication link in a communication network, the method comprises the steps of:

10 establishing the communication link to include a plurality of network elements of the communication network, wherein each of the plurality of network elements is of a particular type of network element of a plurality of network element types, and wherein adjacent network  
15 elements of the plurality of networks elements of a like type are arranged into a grouping of network elements such that the communication link includes a plurality of groupings of network elements;

20 determining each grouping of network elements that include network elements of a first type of network element of the plurality of network elements to produce a set of groupings of network elements; and

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3. The method of claim 2, wherein the producing the first grouping of network elements further comprises:

assigning resources at each of the network elements of the

5 first grouping of network elements; and

linking the network elements of the first grouping of network elements together via the assigned resources.

10 4. The method of claim 1, wherein the determining each grouping of the network elements that include network elements of the first type further comprises at least one of:

15 obtaining a vendor identification of the network elements in the grouping of the network elements;

obtaining functional capabilities of the network elements in the grouping of the network elements; and

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obtaining a first type identifier of the network elements in the grouping of the network elements.

5. The method of claim 1 further comprises:

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processing a communication link alteration request for the communication link to produce a link command; and

- 5   issuing the link command to at least some of the network elements in at least some of the groupings of network elements in the set of groupings of network elements based on the path identifier.

- 10   6.   The method of claim 1 further comprises:

determining each grouping of network elements that include network elements of a second type of network element of the plurality of network elements to produce a second set of

- 15   groupings of network elements; and

assigning a second path identifier to the second set of groupings of network elements.

- 20   7.   The method of claim 6 further comprises:

establishing a link identifier for the communication link, wherein the link identifier associates the first and second path identifiers.

8. A method for establishing a set of groupings of network elements of a communication link in a communication network, the method comprises the steps of:

- 5 identifying each grouping of network elements of the communication link that include a first type of network element of a plurality of network element types to produce identified groupings of network elements; and
- 10 assigning the same path identifier to each grouping of network elements of the identified groupings of network elements to produce the set of groupings of network elements.

- 15 9. The method of claim 8, wherein the identifying each grouping of the network elements that include the first type of network element further comprises at least one of:

obtaining a vendor identification of the network elements

20 in the grouping of network elements;

obtaining functional capabilities of the network elements in the grouping of network elements; and

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obtaining a first type identifier of the network elements in the grouping of network elements.

10. The method of claim 8 further comprises:

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processing a communication link alteration request for the communication link to produce a link command; and

issuing the link command to at least some of the network

10 elements in at least some of the groupings of network elements in the set of groupings of network elements based on the same path identifier.

11. The method of claim 8 further comprises:

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identifying each grouping of network elements of the communication link that include a second type of network element of a plurality of network element types to produce a second identified groupings of network elements; and

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assigning a second same path identifier to each grouping of network elements of the second identified groupings of network elements to produce a second set of groupings of network elements.

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12. The method of claim 11 further comprises:

establishing a link identifier for the communication link,

5 wherein the link identifier associates the set of groupings  
of network elements and the second set of groupings of  
network elements.

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13. A method for altering a communication link in a communication network, the method comprises the steps of:

processing a communication link alteration request for the

- 5 communication link that includes a plurality of network elements to produce a link command;

identifying a path identifier that identifies a set of

groupings of network elements of the plurality of network

- 10 elements, wherein each grouping of network elements of the set of groupings of network elements includes network elements of a first type of network element of a plurality of network element types; and

- 15 issuing the link command to at least some of the network elements in at least some of the groupings of network elements in the set of groupings of network elements based on the path identifier.

- 20 14. The method of claim 13, wherein the processing the communication link alteration request further comprises at least one of:

processing a communication link modification command; and



processing a communication link deletion command.

15. The method of claim 14, wherein the processing the  
5 communication link modification command further comprises:

changing the plurality of network elements that encompass  
the communication link to produce a second plurality of  
network elements;

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identifying each grouping of network elements of the second  
plurality of network elements that include the first type  
of network element to produce identified groupings of  
network elements; and

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assigning the path identifier to each grouping of network  
elements of the identified groupings of network elements.

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assign a path identifier to the set of groupings of network elements.

17. The apparatus of claim 16, wherein the memory further  
5 comprises operational instructions that cause the processing module to establish the communication link by:

accessing a first network manager routine associated with the first type of network element of the plurality of  
10 network element types to produce a first grouping of network elements of the first type;

accessing a second network manger routine associated with a second type of network elements of the plurality of network  
15 elements to produce a second grouping of network elements;

linking the first and second groupings of network elements together;

20 accessing the first network manager routine to produce a third grouping of network elements of the first type; and

linking the second and third groupings of network elements together.

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18. The apparatus of claim 17, wherein the memory further comprises operational instructions that cause the processing module to produce the first grouping of network

5 elements by:

assigning resources at each of the network elements of the first grouping of network elements; and

10 linking the network elements of the first grouping of network elements together via the assigned resources.

19. The apparatus of claim 16, wherein the memory further comprises operational instructions that cause the

15 processing module to determine each grouping of the network elements that include network elements of the first type by at least one of:

obtaining a vendor identification of the network elements  
20 in the grouping of the network elements;

obtaining functional capabilities of the network elements in the grouping of the network elements; and

obtaining a first type identifier of the network elements  
in the grouping of the network elements.

20. The apparatus of claim 16, wherein the memory further  
5 comprises operational instructions that cause the  
processing module to:

process a communication link alteration request for the  
communication link to produce a link command; and

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issue the link command to at least some of the network  
elements in at least some of the groupings of network  
elements in the set of groupings of network elements based  
on the path identifier.

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21. The apparatus of claim 16, wherein the memory further  
comprises operational instructions that cause the  
processing module to:

20 determine each grouping of network elements that include  
network elements of a second type of network element of the  
plurality of network elements to produce a second set of  
groupings of network elements; and

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assign a second path identifier to the second set of groupings of network elements.

22. The apparatus of claim 21, wherein the memory further  
5 comprises operational instructions that cause the processing module to:

establish a link identifier for the communication link,  
wherein the link identifier associates the first and second  
10 path identifiers.

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23. An apparatus for establishing a set of groupings of network elements of a communication link in a communication network, the apparatus comprises:

5 processing module; and

memory operably coupled to the processing module, wherein the memory includes operational instructions that cause the processing module to:

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identify each grouping of network elements of the communication link that include a first type of network element of a plurality of network element types to produce identified groupings of network elements; and

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assign the same path identifier to each grouping of network elements of the identified groupings of network elements to produce the set of groupings of network elements.

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24. The apparatus of claim 23, wherein the memory further comprises operational instructions that cause the processing module to identify each grouping of the network

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elements that include the first type of network element by  
at least one of:

obtaining a vendor identification of the network elements

5 in the grouping of network elements;

obtaining functional capabilities of the network elements  
in the grouping of network elements; and

10 obtaining a first type identifier of the network elements  
in the grouping of network elements.

25. The apparatus of claim 23, wherein the memory further  
comprises operational instructions that cause the

15 processing module to:

process a communication link alteration request for the  
communication link to produce a link command; and

20 issue the link command to at least some of the network  
elements in at least some of the groupings of network  
elements in the set of groupings of network elements based  
on the same path identifier.

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26. The apparatus of claim 23, wherein the memory further comprises operational instructions that cause the processing module to:

5 identify each grouping of network elements of the communication link that include a second type of network element of a plurality of network element types to produce a second identified groupings of network elements; and

10 assign a second same path identifier to each grouping of network elements of the second identified groupings of network elements to produce a second set of groupings of network elements.

15 27. The apparatus of claim 26, wherein the memory further comprises operational instructions that cause the processing module to:

establish a link identifier for the communication link,

20 wherein the link identifier associates the set of groupings of network elements and the second set of groupings of network elements.

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28. An apparatus for altering a communication link in a communication network, the apparatus comprises:

processing module; and

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memory operably coupled to the processing module, wherein the memory includes operational instructions that cause the processing module to:

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process a communication link alteration request for the communication link that includes a plurality of network elements to produce a link command;

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identify a path identifier that identifies a set of groupings of network elements of the plurality of network elements, wherein each grouping of network elements of the set of groupings of network elements includes network elements of a first type of network element of a plurality of network element types; and

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issue the link command to at least some of the network elements in at least some of the groupings of network elements in the set of groupings of network elements based on the path identifier.

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29. The apparatus of claim 28, wherein the memory further comprises operational instructions that cause the processing module to process the communication link alteration request by at least one of:

processing a communication link modification command; and  
processing a communication link deletion command.

30. The apparatus of claim 29, wherein the memory further comprises operational instructions that cause the processing module to process the communication link modification command by:

changing the plurality of network elements that encompass the communication link to produce a second plurality of network elements;

identifying each grouping of network elements of the second plurality of network elements that include the first type of network element to produce identified groupings of network elements; and

assigning the path identifier to each grouping of network elements of the identified groupings of network elements.

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